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The attached memo is in response to your invitation to propose an approach to completing Bulletin 160-03.

cc John Herrick

1/18/03 Draft

A Proposal for Completion of Bulletin 160-03
by Alex Hildebrand

Introduction

The approach to completion of Bulletin 160-03 is currently being reviewed and must be simplified to be completed this year. The Plan may later be further improved, but the law requires it to be issued this year, and it is needed now for consideration in ongoing water management decisions. The State Water Plan must achieve the purpose of the Plan. That purpose is to “determine the water needed to meet the state’s future needs” and to “recommend programs, policies, and facilities to meet those needs”. (Water Code 10004.6). The legislature does not want DWR to establish policy or to embody in the Plan de facto policies on whether “the ‘state’s future needs” for which water is provided should include adequate housing, jobs, food, goods and services, and environmental protection. Nor should the Plan prejudge what the public is willing to pay for a water supply that is adequate to meet each and all basic needs. The Water Plan should supply the best technical information that is now available regarding what would constitute an adequate future water supply for all needs, and how it could be provided. The Water Plan will thereby provide the information needed so that the legislature and the public can make a deliberate decision either to assure an adequate supply for each and all purposes of need, or to let our children bear the consequences of our failure to do so.

Estimating Future Needs

Thirty years ago, we could not have predicted today’s mix of goods and services, or food preferences, or the water efficiency of modern appliances, or the cost of water, etc. The most plausible way to estimate future needs is, therefore, to assume that most broad categories of human need will increase in proportion to population growth per the State’s official population forecast.

In estimating the water needed to meet those needs we can then assume that the water needed will increase somewhat less than in proportion to population growth because, for example, additional and replacement appliances will have the water efficiencies now available. However, the Plan must not assume that purely speculative improvements in efficiency will occur. We must also distinguish between applied water, water that is consumed or irrecoverably lost, and unconsumed applied water that either is or could reasonably be recovered and reused. This is discussed later. This applies to applied versus consumed environmental, urban, and agricultural water.

Estimates of future water needs can not be based on “current trends” because those trends involve, for example, the unsustainable overdraft of groundwater, and the ongoing reallocation of water from production of food to urban and environmental needs.

The Water Plan must comply with both the letter and intent of the law. AB 2587 established the intent of the legislature in regard to providing an agricultural water supply that is sufficient to produce an adequate domestically grown food supply as defined in the statute. We know how much water was consumed or irrecoverably lost in producing the year 2000 food supply. We should assume that the future food need and the consequent consumptive agricultural water need will increase in proportion to the increase in population.

A sustainable future water supply must also be included in the Plan to replace the unsustainable overdraft of groundwater. (Water Code 10004.6 (c) (1))

The planning horizon should be kept at year 2030. The horizon has to be long enough that substantial water measures can be authorized and implemented within the time frame of the Plan.

The estimated future water needed to protect the environment should be based on existing laws and defined existing or committed dedications for that purpose. However, the estimate can be adjusted to allow for any clearly feasible improvements in recycling or multiple use of environmental water. The Plan may cite proposals for increased environmental protection, but it must not create policy that is not already established.

Proposing Measures to Provide the Water Needed to Meet Future Needs

The mix of measures that will be used to provide an adequate water supply will depend on future political, financial, technical, and urgency considerations, and on the need for an adequate multiyear supply and also for drought year supply. However, the Plan should offer one or more mixes of measures that would provide an adequate total supply.

1) Baseline supply

Having estimated the total future supply that is needed we must then quantify the supply that is now available and the extent to which that supply is sustainable. This will by difference establish the need for increased supply.

The studies that have been completed under the heading of “Water Portfolio” provide a competent and credible accounting for the water that was used in each region by purposes of use during the very wet year of 1998, and the normal year of 2000. A similar analysis is expected for the moderately dry year of 2001.

In order to estimate how much more water will be needed in 2030 on a multiyear statistical basis we need several more items of information.

- a) How much of our multiyear supply now derives from the unsustainable net long term overdraft of groundwater?
- b) The real water supply crunch comes during drought situations when reservoir carryover of water is depleted, and we rely on very large overdrafts of groundwater. We, therefore, need to synthesize as best we can a "water portfolio" that would occur now if we were in a drought such as occurred in the early 1990's.
- c) We need to know how much water was released for flood control in each watershed in 1998 and in a representative sequence of years so that we can consider the regional and cumulative feasibility of capturing flood waters in various watersheds for drier year use.

2) New Water Supplies

After completing the estimates of future need and current supply we can then address the new supplies that will be needed in 2030 on both a multiyear and drought year basis.

The next step is to estimate the extent to which various types of measures could contribute to future supply. For example:

- a) What promising opportunities are there for recovering sewage outfalls to the ocean by reverse osmosis to recover water, with brine discharged to the ocean? The Water Portfolio alleges that 1,615,000 acre feet of urban sewage was discharged to the ocean from the south coastal region in 2000. It should not be difficult to arrive at a reasonable and feasible potential for recovery and reuse of sewage discharges from major coastal cities.
- b) A reasonable figure could also be determined for the potential reuse of water by known opportunities to recycle water, including the provision of fish flows by recycling, such as the proposal to recycle water via the DMC to provide fish flows in the main stem of the San Joaquin River.
- c) Similar estimates can cover other means of obtaining water, such as, other reasonable opportunities to desalinize water, and any urban and agricultural conservation measures that reduce the consumptive and irrecoverable loss of water without creating water quality problems. Care must be taken not to double count water conservation measures. For example, measures that reduce the volume of sewage outflow may reduce the water that is otherwise available for recovery by reverse osmosis of sewage flows to the ocean.
- d) Lastly, the remaining water need must be obtained by capturing and storing unutilized flood releases. The best opportunities for this can be judged by looking at the watersheds that now have the largest and most frequent flood releases. These measures to capture flood releases will probably take the longest to implement. The Water Plan should indicate when they would have to be authorized in order to be available when needed. The choices among these opportunities to

capture flood waters will ultimately be influenced by environmental considerations. However, the Plan should assume that a sufficient recovery of floodwater and water released for flood control will be achieved to meet water supply needs that are not otherwise provided. It will be up to the legislature to decide whether environmental concerns trump provision of an adequate water supply. (In making that decision the legislature should consider that the history of the world has shown that when the water supply is insufficient to provide an adequate food supply, there is little public support for environmental water supplies that compete with the production of food.)

Credibility

Some of the estimates that are needed to complete the Plan will be relatively well founded and some will involve educated guesses. The Plan should not be delayed by uncertainties, but it should indicate the basis and the degree of uncertainty for each significant input to the Plan, and why it is the best planning basis that is available at this time.